

REMARKS

By the present Amendment, claims 1-11 are cancelled and claims 12-23 are added. This leaves claims 12-23 pending in the application, with claim 12 being independent.

Substitute Specification

The specification is revised to eliminate grammatical and idiomatic errors in the originally presented specification. The number and nature of the changes made in the specification would render it difficult to consider the case and to arrange the papers for printing or copying. Thus, the substitute specification will facilitate processing of the application. The substitute specification includes no "new matter". Pursuant to M.P.E.P. § 608.01(q), voluntarily filed, substitute specifications under these circumstances should normally be accepted. A marked-up copy of the original specification is appended hereto.

Rejections Under 35 U.S.C. §102 and §103

New claim 12 is drafted as a combination of original claims 1, 2 and 4, and covers a filter element comprising a filter medium 10 with first and second end caps 14, 12, a support tube 20 and contact pins 22. The filter medium has opposite first and second ends 18, 16. The first and second end caps are coupled to the first and second end areas, respectively, by cement beds 26 forming an insulating layer between each end cap and the respective end area. The support tube supports the filter medium on one its sides. The contact pins are on at least the first end cap for dissipating electrostatic charges occurring in filter operation, and penetrate the respective cement bed making dissipative contact with the filter medium. Each contact pin has opposite ends with one end penetrating the respective cement bed and the other end extending vertically from the end cap.

By forming the filter element in this manner with the contact pins on the end cap penetrating a non-conductive insulating cement bed, a simple and effective mechanism is provided for dissipative contact with the filter medium. Providing this dissipative contact by the contact pins allows the contact structure to be simply and economically manufactured while providing a reliable electrical connection. None of the cited patent publications anticipate or render obvious this structure obvious, particularly the structure of the contact pins.

Claims 1-3, 5-7, 10 and 11 stand rejected under 35 U.S.C. §102 as being anticipated by U.S. Patent No. 7,128,835 to Hundley based on International Application No. WO 01/37969. The Hundley patent is cited for a filter element 100 (Fig. 5) having a filter medium 102-105 extending between end caps 110, 111 connected to end areas of the filter medium supported by a support tube 101. The Hundley conductive adhesive (column 20, lines 9-10) is alleged to be contact-making means with the end caps being dissipative (column 20, lines 8-9) to dissipate electric static charges. Relative to claim 2, the Hundley particles of conductive material are interpreted as dissipative contact elements penetrating a cement bed (adhesive) and forming an insulating layer between the end cap and the filter medium therein. Relative to claim 3, the Hundley conductive material is again relied upon. Relative to claim 5, the Hundley filter medium allegedly is pleated and is cylindrical with plural layers. Relative to claim 6, materials 11 and 14 of plastic or metal are alleged to be reinforcements. Relative to claim 7, the support tube 101 allegedly supports the filter medium, as claimed. Relative to claim 10, the Hundley end caps are alleged to provide an annular surface, as claimed. Relative to claim 11, the Hundley end cap 131 (Fig. 7) allegedly has a connecting part for fixing the filter element in a filter housing

141 with a sealing means 148 in the form of an O-ring located between the filter housing and the end cap.

Claims 4, 8 and 9 stand rejected under 35 U.S.C. §103 as being unpatentable over the Hundley patent in view of EP 0 402 657 to Quaas. The Quaas patent is cited for disclosing contact pins 3 with ends penetrating a cement bed in a free end. In support of the rejection, it is alleged that it would be obvious to provide the Quaas contact pins in the Hundley filter to ensure electrical contact between the conductive end cap and the filter medium. The Quaas patent is also cited for contact pins made of conductive metal and arranged in concentric circles.

The Hundley patent discloses a filter element providing electrical connection between the filter medium and the end caps by use of a conductive adhesive at the end caps 110, 111. Admittedly, the Hundley does not disclose or render obvious the use of contact pins on an end cap, as recited in claim 12. Such deficiency is not provided by the Quaas patent since it also does not disclose contact pins on an end cap penetrating a cement bed.

The Quaas patent only discloses a contact structure electrically connecting the filter material in the form of “a linear or strip-shaped flexible conductive additional material (2, 3, 9) contacting the conductive surface layer”, as described in claim 3 of the English language version of the attached copy of the Quaas patent. This Quaas material is folded zigzag, and is provided on longitudinal edges with an electrically conductive small soft metal band that has been rolled on or with metal filament edging. Further, the Quaas contact elements 3 are not pins extending from the end cap, as claimed. This Quaas structure is complex to produce and must be done carefully to prevent malfunctions. In providing this structure, it must be ensured that the contact elements on the end of the filter material come into conductive contact with other parts of the

filter element, such as the support tube and/or the end cap. Such formation can pose problems for the sealing connection of the filter material to the end cap with the end cap being provided with a reliable cement bed.

In the Quaas filter element, preferably a conductive cement bed is provided to ensure an effective electrical contact, and requires relatively expensive conductive sealing material. Such expensive sealing material can only economically be provided very thinly, which thin application adversely affects the sealing capacity of the filter element.

The contact pins of claim 20 are electrically connected to the end cap and extend through a conventional cement bed in order to establish effectively an electrical contact with the filter material without the need for the cement bed being electrically conductive. Thus, a cement bed can be provided in form and in a size that will ensure a maximum sealing capacity of the filter element.

The contact pins recited in claim 12 are also not disclosed or rendered obvious by the connecting structure of U.S. Patent No. 6,099,726 to Gembolis.

Accordingly, claim 12 is patentably distinguishable over the cited patent publications.

Claims 13-23, being dependent upon claim 12, are also allowable for the above reasons. Moreover, these dependent claims recite additional features further distinguishing them over the cited patents.

Claim 13 is further distinguishable by the end cap contact pins being formed of a plastic with a conductivity additive. No such end cap and contact pins are disclosed or rendered obvious by the cited patent documents.

Claim 14 is further distinguishable by the end cap and contact pins having conductive coatings. Contact pins with a conductive coating are not disclosed or rendered obvious by the cited patent documents.

Claim 15 is further distinguishable by the end cap and contact pins being formed of an intrinsically conductive plastic. Contact pins formed of an intrinsically conductive plastic are not disclosed or rendered obvious by the cited patent documents.

Claim 16 is further distinguishable by the contact pins in combination with the filter medium which is of entirely or partially dissipative plastic materials. Such combination is not anticipated or rendered obvious by the cited patent documents.

Claim 17 is further distinguishable by the reinforcement of the filter mat on one side within the overall claimed combination.

Claim 18 is further distinguishable by the support tube with passages supporting the filter medium in the fluid flow direction, within the overall claimed combination.

Claim 19 is further distinguishable by the pins being of conductive metal or dissipative plastic. Such contact pins are not disclosed or rendered obvious by the cited patent documents.

Claim 20 is further distinguishable by the contact pins being arranged in circles concentric with the filter element longitudinal axis. No such arrangement of contact pins is anticipated or rendered obvious the cited patent documents.

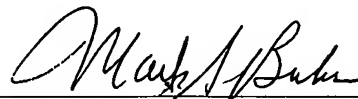
Claim 21 is further distinguishable by the inside and outside annular surfaces in combination with the contact pins.

Claim 22 is further distinguishable by the dissipative seal in combination with the contact pins.

Claim 23 is further distinguishable by the seal being an O-ring in combination with the contact pins.

In view of the foregoing, claims 12-23 are allowable. Prompt and favorable action is solicited.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Mark S. Bicks", is written over a horizontal line.

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